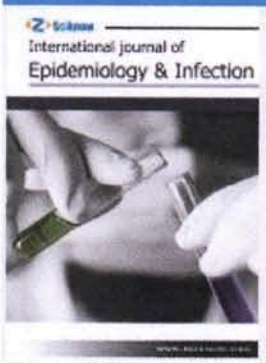
Sciknow

OPEN ACCESS JOURNALS
PEER-REVIEWED JOURNALS
REGISTRATION JOURNALS

# International Journal of Epidemiology & Infection




Print ISSN: 2331-8236 Online ISSN: 2331-8244

## Quick Links



## Overview

The International journal of Epidemiology&Infection is a peer-reviewed, multidisciplinary journal that publishes integrative and substantive reviews. We welcome the submission of article in the areas of subjects , but are not limited to, following: original reports and reviews on all aspects of infection in humans and animals; zoonoses, outbreaks, food hygiene, vaccine studies, statistics and the clinical, social and public-health aspects of infectious disease, as well as some tropical infections.

Statistical Sciences, USA
**Research Areas:** Biostatistics, Experimental Design, Causal Inference, Decision Theory

- *Dr. Turner Nicholas*
  Centre for Mental Health, Addiction and Suicide Research School of Social and Community Medicine University of Bristol, UK
  **Research Areas:** Medical Statistics, Epidemiology of Depression, Psychiatric Assessment Instruments

- *Prof. Vinay Kumar Singh*
  DDU Gorakhpur University, Gorakhpur, UP, India
  **Research Areas:** Natural Plant Products, Pest Control, Vector-Borne Diseases, Toxicology & Pharmacology

- *Dr. Yadong Zheng*
  Lanzhou Veterinary Research Institute, China
  **Research Areas:** Non-coding RNA Biology, Parasitology, Vaccine, Phylogenetics and Evolution, Infection and Immunity

- *Dr. Subha Ganguly*
  West Bengal University of Animal and Fishery Sciences, Kolkata, WB, India
  **Research Areas:** Microbiology and Allied Disciplines

- *Assist. Prof. Pradeep Kumar*
  Department of Zoology, Deen Dayal Upadhyay Gorakhpur University, Gorakhpur 273009, UP, INDIA, India
  **Research Areas:** Aquatic Toxicology, Parasitology, Physiology, Biochemistry, Gastropod Pest Control, Pharmacology, Natural plant product, Epidemiology

- *Dr. Juan Manuel Marquez-Romero*
  Universidad Autónoma de Aguascalientes , Mexico
  **Research Areas:** Stroke, Interventional Neurology and Tropical Neurology

- *Dr. Gulam Hussain Syed*
  , USA
  **Research Areas:** Metabolism, Infectious diseases and Virology

- *Dr. Hammad Qazi*
  University of western Ontario, Department of Health and Rehab sciences, Canada
  **Research Areas:** Public heath, epidemiology, child health, mental health, preventive medicine

- *Prof. Mahmoud Taha*
  Department of Dental Science, College of Dentistry, Mosul University, Iraq
  **Research Areas:** Microbiology, Immunology, Virology, Infectious disease , Molecular Medicine

- *Dr. Darshankumar T. Pathak*
  Department of Microbial Pathogenesis,Howard Hughes Medical Institute,Yale University, USA
  **Research Areas:** Microbiology, Molecular Biology, Biochemistry

## Editor-in-Chief



## Editorial Board

***Contaminated Water and Leptospirosis Infection on Society in Endemic Area Kabupaten Sampang Madura***

Author(s): Dina F Rosyada, Rustaman Riha, Ririh Yudhastuti, Bambang G Irianto, Hari B Notobroto

doi: 10.12966/ijei.11.02.2014, November 2014, v.2, p. 71-74

- Abstract
- Full Text (PDF)

***Influenced Social Capital Related to Stigma, Psychological Stress and Treatment Adherence of Leprosy***

Author(s): Susmiati Nahrowi, Samik Munawar

doi: 10.12966/ijei.11.06.2014, November 2014, v.2, p. 92-96

- Abstract
- Full Text (PDF)

***Quality Assessment of Soymilk Sold in Aba, Southeastern Nigeria***

Author(s): O. R. Ezeigbo, M. U. Ekaiko, T. Kalu, J. A. Nwodu

doi: 10.12966/ijei.11.05.2014, Novembwe 2014, v.2, p. 88-91

- Abstract
- Full Text (PDF)

***Topography and Leptospirosis in Ponorogo District***

Author(s): A. M. Yudied, U. W. Chatharina, Y. Ririh, H. R. Septari

doi: 10.12966/ijei.11.07.2014, November 2014, v.2, p. 97-104

- Abstract
- Full Text (PDF)

*IJEI - 2014 Volume 2, Number 3*

***Modelling of Infectious Disease in Presence of Vaccination and Delay***

Author(s): uttam ghosh, Susmita Sarkar, Dilip Kumar Khan

doi: 10.12966/ijei.08.03.2014, August 2014, v.2, p. 50-57

- Abstract
- Full Text (PDF)

***Retrovesical Hydatid Cyst - A Case Report***

Author(s): Mountassir Moujahid, Iraqui Hicham, Karim Nador, Ahmed Rhari, Issam Serghini, Moulay Hassan Tahiri

doi: 10.12966/ijei.08.01.2014, August 2014, v.2, p. 43-46

- Abstract
- Full Text (PDF)

***Descriptive Study of Pulmonary and Extra-pulmonary TB in Sulaimani, Kurdistan Region, Iraq***

Author(s): Kosar M. Ali, Aso F. Amin, Mohamed O. Mohamed, Suzan N. Ibrahim

doi: 10.12966/ijei.08.04.2014, August 2014, v.2, p. 58-62

## Latest Articles

*IJEI - 2015 Volume 3, Number 1*

***Bacteria Associated With Toilets and Offices Lock Handles***
Author(s): Amala, Smart Enoch, Ade, Adom Jacob
doi: 10.12966/ijei.02.02.2015, February 2015, v.3, p. 12-15

- Abstract
- Full Text (PDF)

***Relationship Study of Physical Environmental Factors, Larvae Free Index, Distribution of Dengue Hemorrhagic Fever and Distance Index to Dengue Hemorrhagic Fever Cases (A Case Study in Gorontalo City Province of Gorontalo)***
Author(s): Lintje Boekoesoe
doi: 10.12966/ijei.02.01.2015, February 2015, v.3, p. 1-11

- Abstract
- Full Text (PDF)

*IJEI - 2014 Volume 2, Number 4*

***Factors Associated with Contracting Typhoid Fever among Residents of Bluegrass Resettlement Area, Sanyati District, Zimbabwe, 2013***
Author(s): Jakopo Zorodzai, Daniel Chirundu, Mufuta Tshimanga, Notion Gombe, Lucia Takundwa, Donewell Bangure
doi: 10.12966/ijei.11.01.2014, November 2014, v.2, p. 63-70

- Abstract
- Full Text (PDF)

***Studies on the Bacteria Burden in Garri Openly Sold in Port Harcourt Markets***
Author(s): Mbata A. Christian, Adegoke O. Adebayo, Nwagu Chinyere, Wali A. Nkemjika
doi: 10.12966/ijei.11.03.2014, November 2014, v.2, p. 75-79

- Abstract
- Full Text (PDF)

***Temporal Relationship between Climatic Factors and the Occurrence of Dengue Fever in an Amazonian Urban Center, Brazil***
Author(s): Marco Aurelio Horta, Paula A. M. Fonseca, Duarte Costa, Christovam Barcellos, Sandra Hacon
doi: 10.12966/ijei.11.04.2014, November 2014, v.2, p. 80-87

- Abstract
- Full Text (PDF)

***Prevalence of Self-reported Language Disorders in Elderly Female, Manaus, Amazonas, Brazil***

Author(s): Karla Geovanna Moraes, Aldo Pacheco Ferreira, Terezinha Lima Silva, Euler Esteves Ribeiro

doi: 10.12966/ijei.09.03.2013, September 2013, v.1, p. 45-51

- Abstract
- Full Text (PDF)

*IJEI - 2013 Volume 1, Number 2*

***Gastro-Intestinal Helminthes of Slaughtered Cattle at Wukari Abattoir Taraba State, North-Eastern Nigeria***

Author(s): Kefas Babale Shitta

doi: 10.12966/ijei.07.02.2013, July 2013, v.1, p. 15-18

- Abstract
- Full Text (PDF)

***Neutralization Antibodies in Oral Poliovirus Vaccine (OPV) Vaccinated Children and Young Adult in Bida North Central, Nigeria***

Author(s): O. P. Oladejo, G. O. Nwobu, O. P. Omosigho, M. Baba, S. Oderinde, E. G. Emumwen, K. A. Otojareri, J. Ndako, S.O. Ogedengbe, A. O. Onoja

doi: 10.12966/ijei.07.03.2013, July 2013, v.1, p. 19-24

- Abstract
- Full Text (PDF)

***Seroprevalence of Chlamydiatrachomatis among HIV Positive Women in Bida, North Central Nigeria***

Author(s): S.O. Ogedengbe, M.I. Agbah, O.P. Omosigho, C. Osuocha, A.O. Akobi, D.T. Ogedengbe, O.P. Oladejo, E.G. Emumwen, K.A. Otojareri, A.O Onoja

doi: 10.12966/ijei.07.01.2013, July 2013, v.1, p. 11-14

- Abstract
- Full Text (PDF)

*IJEI - 2013 Volume 1, Number 1*

***Effect of Granulated Sugar on Some Renal Parameters in Albino Rats***

Author(s): ADEBAYO ADEGOKE, Bamigbowu E. Olugbenga , George –Opuda M. Ibitoroko , Awopeju T. Temitayo , Mbata C. Christian, Braide S. Solomon

doi: 10.12966/ijei.05.01.2013, May 2013, v.1, p. 1-3

- Abstract
- Full Text (PDF)

***Temporal and Spatial Relationship by Environmental Factors as an Effective Prediction for Occurrence of Dengue Fever: Case Study***

Author(s): Marco Aurélio Pereira Horta, Aldo Pacheco Ferreira, Cristina Maria Souza Catita, Fabricio Thomaz de Oliveira Ker, Robson Bruniera

doi: 10.12966/ijei.05.02.2013, May 2013, v.1, p. 4-10

- Abstract
- Full Text (PDF)

***Evaluation of Community-Directed Treatment with Ivermectin (CDTI) in Abia State, South Eastern Nigeria***

Author(s): Ezeigbo, O., Nwoke, B. E. B., Ukaga, C. N., Ajero, C. M. U., Nwachukwu, I.
doi: 10.12966/ijei.02.02.2014, February 2014, v.2, p. 7-15

- Abstract
- Full Text (PDF)

***Malaria Parasitaemia and Some Haematological Parameters of In-Mate in Orphanage Home in Owerri Metropolis***

Author(s): Nwagu Chinyere, Adegoke O. Adebayo
doi: 10.12966/ijei.02.03.2014, February 2014, v.2, p. 16-19

- Abstract
- Full Text (PDF)

*IJEI - 2013 Volume 1, Number 4*

***Prevalence of Surgical Site Nosocomial Infection in A Tertiary Health Care Institution in Nigeria***

Author(s): R.F. Atata, Y.K.E. Ibrahim, P.F. Olurinola, I.A. Adigun, A. Giwa, I.F. Abdul,, A .A. Akanbi II,
doi: 10.12966/ijei.11.01.2013, November 2013, v.1, p. 52-57

- Abstract
- Full Text (PDF)

***The Role of Mobile Phones in the Spread of Bacteria Associated with Nosocomial Infections***

Author(s): Manjula Mehta, Jyoti Sharma, Sonia Bhardwaj
doi: 10.12966/ijei.11.02.2013, November 2013, v.1, p. 58-60

- Abstract
- Full Text (PDF)

*IJEI - 2013 Volume 1, Number 3*

***Food Poisoning amongst Census Enumerators, Gokwe South, Zimbabwe, August 2012.***

Author(s): D Bangure, D Chirundu, M Tshimanga, L Takundwa, N Gombe, H Ndondo
doi: 10.12966/ijei.09.01.2013, September 2013, v.1, p. 25-32

- Abstract
- Full Text (PDF)

***Study of Some Analogue of Currently Clinically Used Antimycobacterial Agents***

Author(s): Mohammad Asif
doi: 10.12966/ijei.09.02.2013, September 2013, v.1, p. 33-44

- Abstract
- Full Text (PDF)

- Abstract
- Full Text (PDF)

***Recurrent Vulvovaginitis and Herpes Simplex Virus***

Author(s): G. Ventolini, A. Cruz, J. Yaklic, J. Duke

doi: 10.12966/ijei.08.02.2014, August 2014, v.2, p. 47-49

- Abstract
- Full Text (PDF)

*IJEI - 2014 Volume 2, Number 2*

***Prevalence and Antibiotic Susceptibility Patterns of Pseudomonas Aeruginosa in Minna, North Central Nigeria***

Author(s): AK Ndukwe, OP Omosigho, TKC Udeani , AO Onoja, SO Ogendengbe , MS Ndochi, IO Abdulganiyu , AO Sedenu , CI Okoro , LU Eluagu, E Ekoh

doi: 10.12966/ijei.05.02.2014, May 2014, v.2, p. 25-31

- Abstract
- Full Text (PDF)

***Fasting Blood Glucose and Lipid Profile in Human Immune Defi-ciency Virus Positive Population in Kaduna, North Central Nigeria***

Author(s): MS Ndochi, OP Omosigho, SI Ogbu, AK Ndukwe, OP Oladejo, IO Abdul Ganiyu , CS Akpotohwo , AF Akpata, VA Abegbe, NW Ohiri , LU Ogheneke

doi: 10.12966/ijei.05.03.2014, May 2014, v.2, p. 32-35

- Abstract
- Full Text (PDF)

***Relationship Season and Case Leptospirosis in the District Gresik Year 2009-2011***

Author(s): Ririh Yudhastuti

doi: 10.12966/ijei.05.01.2014, May 2014, v.2, p. 20-24

- Abstract
- Full Text (PDF)

***Evaluation of Acute Flaccid Paralysis Surveillance System in Sanyati District, Zimbabwe, 2013***

Author(s): Donewell Bangure, Daniel Chirundu, Humphrey Ndondo, Mufuta Tshimanga, Notion Gombe, Lucia Takundwa

doi: 10.12966/ijei.05.04.2014, May 2014, v.2, p. 36-42

- Abstract
- Full Text (PDF)

*IJEI - 2014 Volume 2, Number 1*

***In Vitro Antibacterial Activity of Emblica Officinalis and Tamarindus Indica Seed Extracts against Multidrug Resistant Acinetobacter Baumannii***

Author(s): Krupali Ramanuj, Vijay Kothari, DR. Kothari

doi: 10.12966/ijei.02.01.2014, February 2014, v.2, p. 1-6

Sciknow Publications Ltd.
International Journal of Epidemiology & Infection


IJEI 2014, 2(2):20-24
DOI: 10.12966/ijei.05.01.2014

# Relationship Season and Case Leptospirosis in the District Gresik Year 2009-2011

**Ririh Yudhastuti***

Environmental Health Department, Public Health Faculty, Airlangga University, Surabaya, Indonesia

*Corresponding author (Email: ririh.unair@gmail.com)

**Abstract** - One of the impacts of climate change is the possibility of a continuous increase in the incidence of rodent borne disease. Zoonotic Leptospirosis is a disease that is transmitted through body fluids such as urine from rodent feces and fluid from the cause of death in many tropical countries. Previous research claimed that the variations in season (temperature, humidity, rainfall and solar radiation length) have a significant correlation with a case of leptospirosis in Gresik regency. The purpose of this study was to find a picture and the relationship between season factors (temperature, humidity, precipitation, solar radiation and long) with leptospirosis cases Gresik years 2009-2011. Data collected included secondary data season factors and the number of cases of leptospirosis. The results of this study indicate that there is no significant relationship between season factors of temperature, humidity, rainfall and solar radiation length) with a case of leptospirosis in Gresik years 2009-2011. This is due to lack of long-duration data is retrieved, incomplete climate data obtained.

**Keywords** - Rainfall, Leptospirosis Cases

## 1. Introduction

Transmission of some infectious diseases is influenced by season factors. Parasites and disease vectors are very sensitive to season factors, especially temperature, precipitation, humidity, water, and wind. So also in the case of the distribution and abundance of organisms vector and intermediate host. The disease is spread through rodent (rodent borne disease) such as leptospirosis, hanta virus, plague, rat bite disease, salmonellosis and rabies as mice; need to watch out because the transmission of the disease as this will increase with climate change. In many countries, the disease can cause death. The spread of rodent-borne diseases as a threat to public health, one of which is a disease leptospirosis.

Leptospirosis is a disease caused by infection zoonosis spiral-shaped bacteria of the genus *Leptospira* that pathogen, attacking animals and humans. Transmission of leptospirosis in humans is transmitted by infected animals *leptospira* bacteria usually enter through the conjunctiva or broken skin. In the intact skin infections may also occur when a person is in contact with water, soil, and plants contaminated with rat urine or other sick animal leptospirosis.

International Leptospirosis Society stated that Indonesia as a country is quite high incidence of leptospirosis mortality and is ranked third in the world. It is based on the number of cases Leptospirosis in Jakarta due to flooding that occurred in 2002 reached 113 leptospirosis patients and 20 of them died (Case Fatality Rate leptospirosis was 19.4%).

Gresik is a region in the province of East Java that has the largest number of cases in East Java. Leptospirosis cases in 2009-2011 by 74 with the death of 31 cases. The state of flooding in some districts in the district causing adanaya genanagan environmental changes such as water, muddy muddy environment and the large pile of garbage that causes leptospira bacteria multiply. The study was conducted to determine the relationship between image and season factors (temperature, precipitation, solar radiation length, humidity) with leptospirosis cases in Gresik years 2009-2011.

## 2. Research Methods

This study is a quantitative and descriptive study using ecological study design. This study can determine the relationship between season factors (temperature, humidity, rainfall, solar radiation length) and Leptospirosis cases in Gresik 2009-2011.

What research is in the area of Gresik regency, East Java, with 11 districts. What is used as study sites with consideration of

the existing 18 districts 11 districts often leptospirosis cases for 3 years. The timing of the data collection was carried out during March-May 2012.

The population in this study was all recorded cases of leptospirosis in Gresik years 2009-2011. Sampling was not done because the observations were made on the total population of the observation unit is Gresik. Data collection was performed by taking leptospirosis secondary data from Ibnu Sina Hospital Gresik. Data is limited to Gresik regency with 11 districts. Data climate factors such as temperature, humidity, rainfall, solar radiation obtainable length of the Great Hall of the Meteorology and Geophysics Agency Region Perak Surabaya station, then performed selecting the appropriate data to the variables to be analyzed. Data analysis was carried out to provide good information after data leptospirosis cases and season factors Gresik years 2009-2011 collected. Stages of analysis performed is univariate and bivariate. Univariate analysis useful to illustrate the distribution of the number of cases of leptospirosis and the description of fluctuations in season factors (temperature, humidity, rainfall, solar radiation length) in 2009-2011. Bivariate analysis using regression-correlation test is conducted to see the relationship between the independent variables with the dependent variable season factors, namely the number of cases of leptospirosis in Gresik years 2009-2011.

## 3. Results and Discussion

**Overview of the study area**

Location Gresik is located in the northwest city of Surabaya is the capital of East Java province with an area of 1191.25 km2 which is divided into 18 districts and consists of 330 villages and 26 Urban Village, Gresik regency Geographically located between 112° to 113° longitude East and 7° to 8° south latitude and is lowland with a height of 2 to 12 meters above sea level except Sub Panceng which has a height of 25 meters above sea level. Some Gresik regency is the coast, which extends from the District Kebomas, Gresik, Manyar, Bungah, Sidayu, Ujungpangkah and Panceng and District Sangkapura and ponds located at the island Bawean.Temperature pretty hot in the study area, which is an average between22.600 to 34.100 C, and the humidity is between 42% - 97%., Average rainfall between 120-190 mm.

Leptospirosis cases. It is known that cases of leptospirosis in Gresik regency during the 3 years showed a stable number of cases of disease and leptospirosis, the number of cases includes 32, 21, 21 for the period 2009-2011dengan 10,12,9 deaths for the period 2009-2011. Complete data on cases of leptospirosis dpat shown in table 1.

**Table 1.** Recapitulation Leptospirosis cases data (+) in Gresik district

| Month | Cases | | | Dead | | |
|---|---|---|---|---|---|---|
| | 2009 | 2010 | 2011 | 2009 | 2010 | 2011 |
| January | 2 | 4 | 2 | 2 | 2 | 1 |
| February | 3 | 2 | 1 | 0 | 0 | 1 |
| March | 7 | 3 | 2 | 2 | 3 | 0 |
| April | 4 | 2 | 5 | 0 | 2 | 2 |
| Mei | 3 | 2 | 3 | 0 | 2 | 2 |
| June | 3 | 2 | 1 | 1 | 2 | 0 |
| July | 2 | 0 | 2 | 1 | 0 | 1 |
| Augustus | 1 | 1 | 0 | 0 | 0 | 0 |
| September | 1 | 3 | 1 | 1 | 0 | 0 |
| October | 0 | 0 | 1 | 0 | 0 | 0 |
| Novemher | 3 | 2 | 2 | 3 | 1 | 2 |
| December | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 32 | 21 | 21 | 10 | 12 | 9 |

### *3.1. Temperature with Leptospirosis Cases*

There was no significant correlation between the temperature of the leptospirosis cases in the study area is probably because the average temperature per month ranged from 22.600 to 34.100 C less support in the process of transmission of *leptospira* bacteria by rats / rodents. Although the temperature in Gresik is the optimal temperature and can cause the number of rodents increase, but there is a possibility that the existing rodent and increased amounts are not infectious so no effect on increasing the number of cases of leptospirosis. Additionally, it may occur due to factors personal hygiene and environmental sanitation are implemented community is going well.

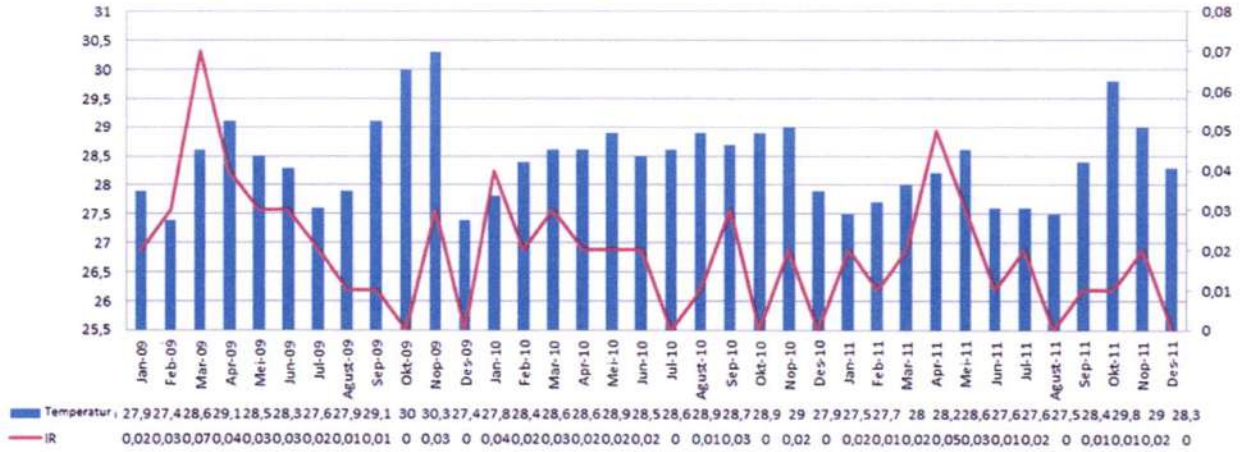



**Fig. 1.** Temperatures relationship with Leptospirosis cases in Gresik years 2009-2011

### *3.2. Humidity with Leptospirosis Cases*

On the results of this study showed no association between moisture with leptospirosis cases in Gresik. This rodent as carriers of *leptospira* bacteria are not affected by moisture. Descriptively, humidity averaged over the period 2009-2011 in Gresik is between 42-97%. Humidity is included in the upper limit of the optimum moisture rodent to breed, so the lack of meaningful relationship between humidity and cases of leptospirosis in Gresik may occur. Optimal rodent humidity is 70-80%. In addition, because data on cases suspected leptospirosis and humidity season factors only for 3 years ie 2009 -2011 causing an analysis of the relationship is less detailed. Humidity can affect rodent borne disease transmission, especially rats. The ability of rodent in decreased survival in dry conditions. The average humidity has been found to be the most critical factor.

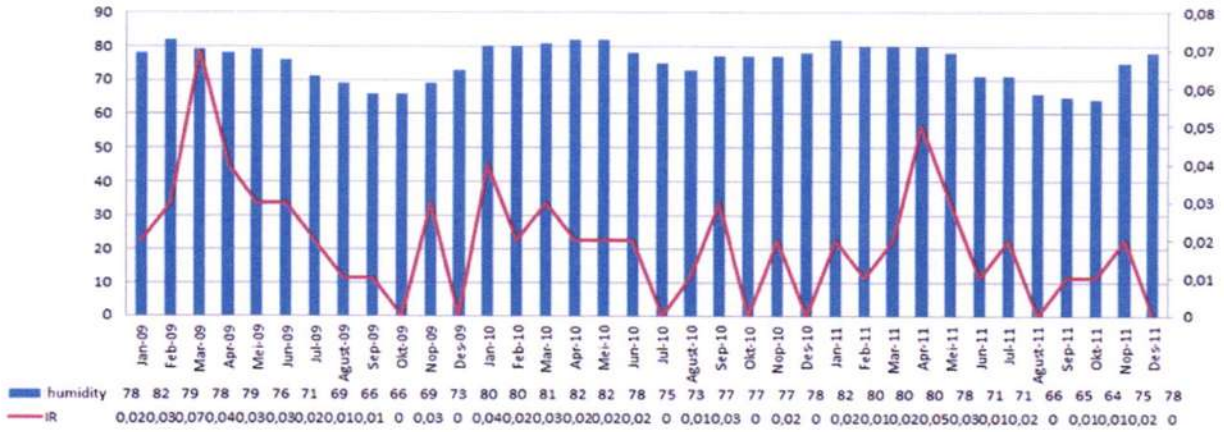



**Fig. 2.** Humidity relationship with Leptospirosis cases in Gresik years 2009-2011

### *3.3. Rainfall with Leptospirosis Cases*

Climate can affect the patterns of infectious diseases because disease agents either viruses, bacteria or parasites, vectors are sensitive to temperature, humidity and other ambient environmental conditions. In addition, the WHO also states that the rodent-borne diseases such as leptospirosis associated with warm weather conditions. From the observation of the WHO South-East Asia region concluded that Leptospirosis is re-emerging infectious diseases in Southeast Asia. Climate and environmental conditions, the availability of the host, population density, and behavioral factors support high transmission of disease in the Region.

Research conducted Avia Putriati Martha (2012) concluded that there is a significant relationship between urine factor in rats and the customs of the people who do not wear shoes, although a history of significant flooding is not related to the incidence of leptospirosis. However, the presence of high rainfall causes sewers and piles of garbage to be filled and disturb residential neighborhood health as a result is the number of rats breeding. There was a significant association between the presence of rats with Leptospirosis is the same thing with Agus Priyanto and research fellows in the City of Demak in Central Java. Same thing with the research Svilena Ivanova et al., 2012, in Cambodia. Rodent infection was higher in the location of existing water

resources in rainfed example especially in the rainy season Kaev Seima. Rat (Rattus exulans) and the Mouse Shrew (*Suncus murinus*) inhabiting households showed a low level of infection, whereas mice living around the plantation showed a higher rate of transmission. Similarly, research Kawaguci Leo et al. (2008), this suggests that leptospirosis is endemic in Khammouane province and local flooding plays an important role in the transmission of the disease leptospirosis region. In the Philippines, on the other hand, leptospirosis patients were more likely to be found in areas prone to flooding from urban settings such as Metro Manila, which was found to be the focus of endemic leptospirosis, leptospirosis in the Philippines are considered to be associated with heavy rainfall, rapid urbanization (a dramatic increase in the population), deforestation, increase in the number of flood-prone areas, poor infrastructure. In the United State and Canada, rainfall events can be used as a prediction of leptospirosis in dogs (Ward, 2002).

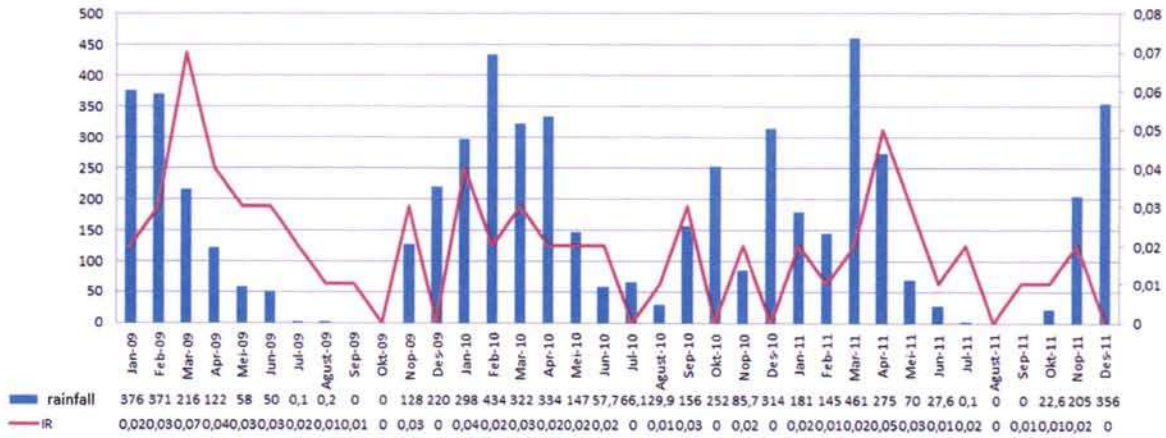



**Fig. 3.** Rainfall relationship with Leptospirosis cases in Gresik years 2009-2011.

### *3.4. Duration of Lighting Solar*

Intensity or duration of solar lighting is very influential with the temperature and humidity around it. Rodent or rats are animals active at night, so the sun shines longer affect the activity of the rodent. Lighting sun's effect on rodent habit to rest until sunset. Rodent rest in a dark place and protected from the sun for reproductive activities, as well as in the habit of putting up food for the group.

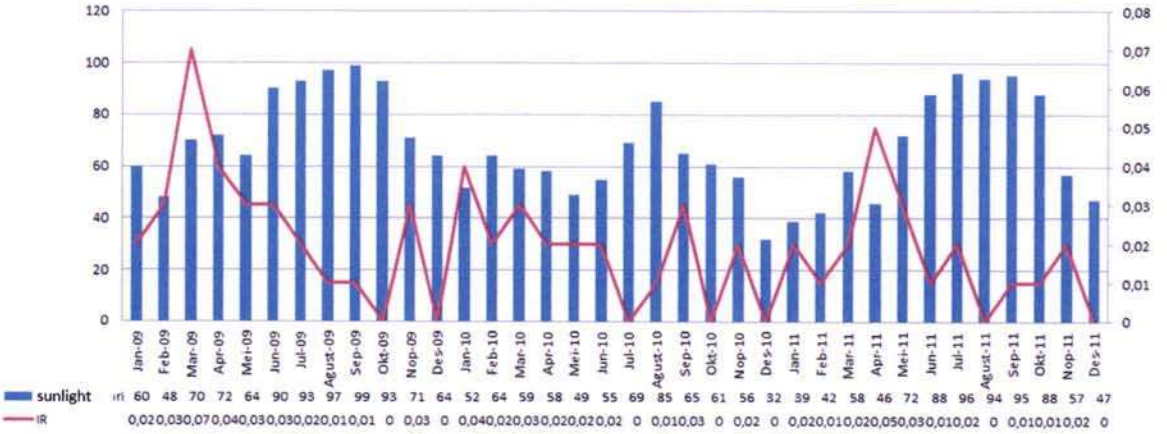



**Fig. 4.** Sunligt relationship with Leptospirosis cases in Gresik years 2009-2011.

The average length of solar radiation during the period 2009-2011 in Gresik ranged from 63.9%. There was no significant correlation between duration of solar radiation with leptospirosis cases longer possible because the solar radiation is closely linked with temperature and humidity. Because moisture in Gresik is the upper limit of the optimum moisture rodent breeding the lack meaningful may occur.

Strong link between temperature and duration of solar radiation fluctuations indicated by the increase / decrease the look almost the same in the comparison chart of temperature and solar radiation length. Then rodent that has the characteristics of a place to rest in a dark place and protected from the sun and Harii dinner time finding where the sun is not too bright so long factor in the deployment of solar radiation is small rodent.

## 4. Conclusion

Overall, no one had studied season factors (temperature, humidity, rainfall and solar radiation length) has a significant relationship to the case of leptospirosis in Gresik regency years 2009-2011 There are a few things that might make this happen. Some of them are less duration data is retrieved, incomplete climate data obtained, and the lack of frequency data taken leptospirosis cases. Moreover, it may attempt personal hygiene and environmental sanitation implemented community in Gresik pretty good.

There is a possibility of this study is less accurate because it only took three years of data, so there is no season factors appear to have a significant relationship with the Department of Health leptospirosis Sebaiknya cases in collaboration with the Meteorology and Geophysics Agency that season factors can be monitored well. The community should always be moved in the residential housing sanitation program in which rodents were found there.

## Reference


Agung Prasetyo (2006). Risk factors Severe Leptospirosis in The City of Semarang, Medicine Faculty .Thesis of Diponegoro University.

Assimina Zavitsanou and Fotoula Babatsikou (2008). Leptospirosis: Epidemiology and Preventive Measures. *Health Science Journal.* Vol 2, Issue 2.

Brisbois, B. W., Ali, S. H. (2010). Climate Change, Vector- Borne Disease and Interdisciplinary Research: Social Science Perspectives on an Environment and Health Controversy. *Ecohealth,* Heidelberg: Springer, 2010.

Georgios, P., Photini, P., Vasiliki, S., Leonidas, C., Nikolaos, A. (2008). The Globalization of Leptospirosis, *Worldwide Incidence Trends International Journal of Infectious Diseases.* **12,** 351-357.

Gresik District Health Department (2011). Gresik District Health Profile, 2010.

Johnson, M. A., Smith, H., Joseph, P., Gilman, R. H., Bautista, C. T., & Campos, K. J. (2004). Environmental Exposure and Leptospirosis. *Peru Emerging Infectious Diseases. June: 10(6),* 1016-1022.

Koizumi, N., Maki, M., Tsutomu, T., Hiroshi, M., Yoshiko, S., EJI, H., Nobuaki, A., Mayu, H., Hiroki, K., & Haruo, W. (2009). Human leptospirosis cases and prevalence of leptospira interrogans harbouring rats in urban areas of Tokyo, *Japan. Journal of Medical Microbiology,* **58.** 1227-1230.

Lemeshow, S., dan David, W. H. Jr. (1997). In a large sample of Health Research. Gajah Mada University Press.

Levett, P. N. (2001). Leptospirosis. *Clinical Microbiology Review.* **14,** 296 -326.

Ministry of Health of the Republic of Indonesia (2007). Guidelines for implementation of health programs in Indonesia neighborhood. P2M DG & PL. MoH RI Jakarta.

Nakamura, M., Taira, K., Itokazu, K., Kudaka, J., Asato, R., Kise, T., & Koizumi, N. (2006). Sporadic cases and an outbreak of leptospirosis probably associated with recreational activities in rivers in the northern part of Okinawa Main Island. *J Vet Med* Sci **68,** 83-85.

Narita, M., Fujitani, S., Haake, D. A., & Paterson, D. L. (2005). Leptospirosis after recreational exposure to water in the Yaeyama Islands, *Japan. Am J Trop Med Hyg* **73,** 652-656.

Natarajaseenivasan. K. (2004). Human leptospirosis in Erode, South India. Serology, Isolation and Characterization of the isolates by Randomly Amplified Polymorphic DNA (RAPD) fingerprinting, *Japan Journal of Infection Disease.* p 193-197.

Oktarini, M., Purwana, R., & M Djaya, I. M. (2007). Relations Environmental Factors and Individual Characteristic Genesis against Leptospirosis in Jakarta. *Makara Journal of Health, University of Indonesia. 11(1),*17-24.

Stewart, J. (2003). Environmental and Housing. ACAP4EE London. Spon Press. (1), 23 -35.

Urnimala, S. S. F., Nascimento, R. B., Ridalva, M., Hector, N., Ippolytos, K., Itamar, G., Brendan, F., Juarez, D., Lee, W. R., Mitermayer, G. R., & Alberto, I. K. (2002). Population – based case Control Investigation of Risk factors for Leptospirosis during an Urban Epidemic. *American Journal of Tropical Medicine and Hygiene,* pp 605 -610.

Nakamura, M., Taira, K., Itokazu, K., Kudaka, J., Asato, R., Kise, T., & Koizumi, N. (2006). Sporadic cases and an outbreak of leptospirosis probably associated with recreational activities in rivers in the northern part of Okinawa Main Island. *J Vet Med* Sci **68,** 83-85.

Narita, M., Fujitani, S., Haake, D. A., & Paterson, D. L. (2005). Leptospirosis after recreational exposure to water in the Yaeyama Islands, *Japan. Am J Trop Med Hyg* **73,** 652-656.

Natarajaseenivasan. K. (2004). Human leptospirosis in Erode, South India. Serology, Isolation and Characterization of the isolates by Randomly Amplified Polymorphic DNA (RAPD) fingerprinting, *Japan Journal of Infection Disease.* p 193-197.

Sergio.ADM, E., Gonzalez, F., Verdalet, G. M. S., Soler, H. E., Rivas, S. B., Victor, M. A. A., & Espinosa, J. N. (2012). Clinical Study: Leptospirosis Prevalence in Patient With Initial Diagnosis of Dengue. *Journal of Tropical Medicine Vol. 2012.* Article ID 519701, 5 pages.

Ward. P. Michael (2002). Preventive Vetenary Medicine 56, 203-213.